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CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK FOR WASHINGTON

and

FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,

and

DEPARTMENT of WATER RESOURCES STATE of WASHINGTON

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, and other Federal, State and Private organizations.

AS OF
FEB. 1, 1970

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80202
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Building, Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 340, Casper, Wyoming 82601

PUBLISHED BY OTHER AGENCIES.

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



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WATER SUPPLY OUTLOOK FOR WASHINGTON

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

Issued by

KENNETH E. GRANT

ADMINISTRATOR
SOIL CONSERVATION SERVICE
WASHINGTON, D.C.

|||||

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In Cooperation with

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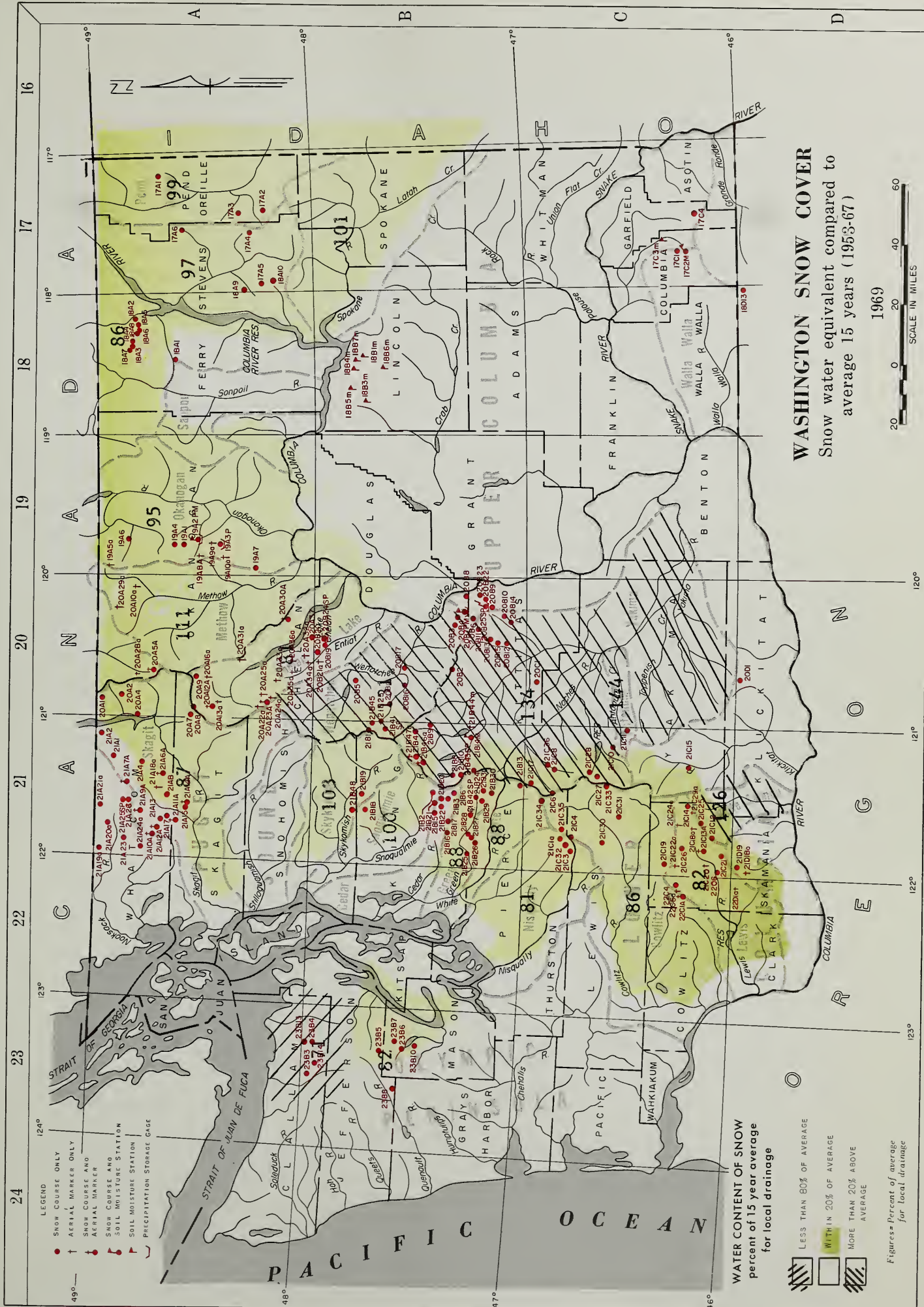
DIRECTOR
DEPARTMENT OF WATER RESOURCES
STATE OF WASHINGTON

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Report prepared by

ROBERT T. DAVIS, Snow Survey Supervisor

SOIL CONSERVATION SERVICE
360 U.S. COURTHOUSE
SPOKANE, WASHINGTON 99201



INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.							
UPPER COLUMBIA DRAINAGE																								
Boyer Mountain	17A2	7	31N	43E	5250	Pend Oreille River											Skagit River	21A4	35	39N	12E	2200		
	17A1	24	37N	44E	5000		Beaver Creek Trail	21A1	9	39N	12E	3680												
	17A3	30	33N	43E	2970		Beaver Pass	20A1	34	38N	16E	5900												
							Devils Park	20A2	14	40N	14E	3500												
Kettle River	18A2	36	39N	36E	1450	Squilehuck Creek	20B3	12	21N	19E	4400	Freezeout Creek Trail	20A2	8	40N	16E	5000							
	18A3	28	39N	35E	4070		Scout-A-Vista	20B4	18	21N	20E		3400	20A2	19	40N	14E	2600						
	18A6	5	38N	36E	2720		Jump-Off	20B8	34	21N	20E		4450	20A2	19	40N	14E	2600						
	18A7	20	38N	35E	4600		Stemilt Slide	20B9	30	21N	20E		5000	20A8	29	36N	14E	1900						
							Upper Wheeler	20B7FM	30	21N	20E		4400	20A7	15	35N	14E	4200						
Colville River	17A6	19	36N	42E	3215	Crab Creek	20B8	34	21N	20E	4450	Baker River	21A1A	8	36N	8E	3800							
	18A3	28	39N	35E	4070		Stemilt Slide	20B9	30	21N	20E		5000	21A7A	19	39N	11E	5200						
	18A6	5	38N	36E	2720		Upper Wheeler	20B7FM	30	21N	20E		4400	21A6A	17	35N	11E	5000						
	18A7	20	38N	35E	4600		Creston-Kunz	20B8	34	21N	20E		4450	21A7	31	37N	9E	800						
							Jack Woods	18B3m	28	27N	31E		2750	Komo Kulshan	21A9A	23	32N	8E	3600					
Stranger Mountain	17A7	11	32N	41E	4925	Yakima River	18B4m	21	27N	33E	2420	Cowlitz River	21A18a	27	33N	10E	5800							
	17A6	19	36N	42E	3215		18B5m	17	27N	32E	2378		21A12a	20	37N	2E	2100							
	17A5	26	31N	38E	4990		18B7m	24	27N	33E	2440		21A10a	18	37N	8E	3200							
	18A10	6	29N	38E	3370		Sherman	18B6m	24	25N	32E		2290	21A14a	20	36N	9E	4400						
							Wheatridge	18B6m	24	25N	32E		2290	S. F. Thunder Creek	21A13	22	37N	8E	1600					
Sanpoil River	18A1	10	36N	35E	5350	Ahtanum R. S.	21C11	26	12N	14E	3100	Three Mile Creek	21A15	18	36N	9E	4500							
	19A8a	2	36N	23E	7000		Big Boulder Creek	21B9	35	23N	14E		3200	Watson Lakes	21A2	25	37N	9E	4500					
	19A9a	20	37N	24E	6750		Bumping Lake	21C8	23	16N	12E		3450	Noakstack River	21A19a	7	40N	7E	4400					
	19A4	10	37N	24E	6000		Bumping Lake New	21C36	13	16N	12E		3470		Canyon	21A20a	20	40N	8E	5100				
	19A3P	18	35N	24E	4000		Clockum Pass	20B9	25	20N	20E		5370		Glacier Creek	21A23	9-10	38N	7E	4500				
Sherman Creek Pass	18A1	10	36N	35E	5350	Methow River	20B10	17	19N	20E	4123	Dungeness River	21A26	17	39N	9E	4300							
	19A8a	2	36N	23E	7000		Domey Flat	21B44m	15	20N	14E		2200	Panorama New	21A26	17	39N	9E	4300					
	19A9a	20	37N	24E	6750		Fish Lake	21B4	34	24N	14E		3371	Panorama Snow Pillow	21A25SP	17	39N	9E	4300					
	19A4	10	37N	24E	6000		Green Lake	21C10	3	12N	13E		6000	Twin Lakes	21A21a	16	40N	9E	5200					
	19A3P	18	35N	24E	4000		Grouse Camp	20B11	34	20N	19E		5385	OLYMPIC PENINSULA										
19A10a	15	35N	23E	6750	High Creek	20B12	34	20N	19E	5390	Deer Park	23B4	1		28N	5W	5200							
19A6	30	39N	25E	2845	Joe Lake	21B45a	22	23N	12E	4624	Cox Valley	23B14	29		28N	6W	4850							
Methow River	20A10a	10	38N	20E	6400	Lower COLUMBIA DRAINAGE	Asotin Creek	17C4	9	8N	42E	5700	Morse Creek	23B13	1	28N	5W	4850						
	20A29a	8	39N	20E	7000			Astin Creek	17C4	9	8N	42E		5700	Elwha River	23B3	36	29N	7W	4500				
	20A5a	7	37N	18E	6500				Mill Creek	17C1	2	9N		35E		3370	Skokomish River	23B7	17	24N	5W	4200		
	19A5a	15	40N	23E	4650					Couse	17C1	11		9N		40E		4030	Black and White	23B6	16	24N	5W	4700
	19A7	36	34N	23E	4650						Homesstead	17C2M		23		9N		40E	4400	Four Stream	23B10	1	23N	6W
Chelon Lake Basin	20A22a	12	31N	15E	6500	Martin Springs (Helmets SM)	18D13					22	6N	38E		2400		Home Sweet Home	23B5	28	25N	5W	5200	
	20A25a	3	31N	16E	5275		Klickitat River	20D1				21	6N	17E	4030	Sundown Pass		23B8	25	24N	7W	3900		
	20A23a	18	31N	16E	5900			Satus Pass	21C15			23	9N	12E	3000									
	20A13a	18	34N	16E	2220				West Fork Cabin	21C15		23	9N	12E	3000									
	20A12a	7	34N	16E	4600					White Salmon River	21C12	35	7N	8E	4000									
20A10a	34	33N	18E	6500	Lewis River	21C12a					19	9N	8E	4800										
20A9a	21	35N	17E	3730		Blue Lake	21C21a				25	8N	7E	2200										
20A30a	32	31N	20E	6300			Bobb's Trail	21C21a			25	8N	7E	2200										
20A30a	32	31N	20E	6300				Calamity Ridge	21C16a		8	5N	5E	2500										
20A30a	34	33N	18E	6500					Council Pass	21C16a	24	9N	9E	4200										
Enriat River	20B19	34	22N	19E	1600					Wenatchee River	21B23	7	26N	15E	2925									
	20A33a	28	31N	17E	4800	Bernie-Mill Creek					21B23	7	26N	15E	2925									
	20A34a	2	30N	17E	3150		Bernie-Mill Creek (New)				21B23P	31	26N	17E	3240									
	20A36a	17	30N	18E	6310			Blevett Pass No. 2			20B2	35	22N	14E	4270									
	20B20	22	29N	18E	4300				Chiwaukum G. S.		20B16	4	25N	17E	1610									
20B24SP	22	29N	18E	4300	Lake Wenatchee					20B5	33	27N	17E	1127										
20A32a	34	30N	18E	4300		Leavenworth R. S.				20B17	1	24N	17E	1127										
20A37	20	29N	19E	6200			Merritt			20B18	4	26N	16E	2140										
20A39a	21	33N	17E	3850				Stevens Pass		21B1	14	26N	13E	4070										
20B21a	10	28N	18E	5300					Stevens Pass Sand Shed	21B45	12	26N	19E	3700										
					Crough #2					20B25SP	10	20N	20E	5310										

WATER SUPPLY OUTLOOK

State of Washington
February 1, 1970

* The water supply outlook for irrigation and power in the Columbia *
* Basin in Washington and on its tributary streams is slightly be- *
* low normal. The central area of the state is the bright spot *
* having generally above-normal snowpacks. Snow surveys made in *
* the state and adjacent areas indicate the snowpack ranges from *
* 40 percent below normal on the Elwha River drainage in the Olympic *
* Peninsula to 44 percent above normal on the Ahtanum Creek *
* watershed, a tributary to the Yakima River. There seems to be a *
* slight polarization in the snowpack as of February 1. Conditions *
* along the northern boundary and in Canada are not as good as can *
* be found along the southern portions of the state and through the *
* central area mentioned above. The higher elevation snowpacks *
* also do not seem to be as good as those in the medium elevation *
* areas. *

* Precipitation over the state, as measured at valley stations dur- *
* ing January, were well above normal but this occurred primarily *
* in the latter half of the month. This precipitation did not over- *
* come the deficit that occurred during the previous two to three *
* months. Fall precipitation was close to normal while the winter *
* precipitation was above normal only in the southeastern portion *
* and the northcentral area. Franklin D. Roosevelt Lake is the only *
* power reservoir in the state that has above-normal water in stor- *
* age as of February 1. Irrigation reservoirs generally have below *
* normal water in storage as of this date but should fill with the *
* anticipated runoff this coming spring. *

SNOW COVER

Compared to last year every watershed in the state has much less snow as of February 1. Compared to 1968 this snowpack varies from 25 percent below to 181 percent above. These extremes were measured by only one snow course in each of these two watersheds. Comparing this snowpack to normal most of the watersheds can be considered normal with the exception of the Entiat, Wenatchee, Yakima, Ahtanum, and White Salmon. These have well above-normal snowpacks as mentioned above. The Elwha on the Olympic Peninsula has a snowpack that is only 60 percent of normal.

RESERVOIRS

The irrigation picture in the state can be considered only fair as of this time. While it is expected that all irrigation reservoirs will fill, normal and above precipitation will have to occur between now and the start of the runoff season. The five Yakima reservoirs are 43 percent of capacity and 73 percent of average for

this time of year. Conconully Reservoir in the Okanogan watershed is the only one that has above-normal amounts of water in storage. The power reservoirs of Coeur d'Alene Lake and Franklin D. Roosevelt Lake have greater than normal amounts of water in storage while Lake Chelan and Ross Reservoir have less than normal amounts of reservoir water.

PRECIPITATION

The preliminary analysis by the United States Weather Bureau of valley precipitation indicates that during the September-October period rainfall was slightly above normal. Rainfall was 22 percent above normal in the Columbia River drainage in Canada; 29 percent above in the northeastern portion of the state and 44 percent above normal in northcentral Washington. Along the northwestern slopes of the Cascades precipitation was 5 percent above normal and 24 percent above in the lower Columbia drainage. Central Washington had the least amount of precipitation during this period -- 14 percent below normal. Precipitation during the past month ranged from a low of 80 percent of normal at Paradise Ranger Station to a high of 177 percent above normal at Coulee Dam. In the Yakima drainage the Bureau of Reclamation reports that precipitation at the five reservoirs was 52 percent above normal but since the period of September 1 averaged only 82 percent of normal.

SOIL MOISTURE

The soil moisture in the soil mantle reflected the lack of precipitation during the latter part of the summer and early fall periods. At lower elevations the recent heavy precipitation has improved this situation until at the present time the conditions are very close to normal for this time of year. Some areas have reported more moisture in the soils than measured in the last couple of years while others had a reverse affect. Our records are not sufficiently long to have an average condition determined in the soil moisture but the fall precipitation has always been a reasonably good indicator of this situation.

STREAMFLOW

As usual for this time of year runoff ranges from very high to very low. In this case the Upper Columbia had below normal runoff during January starting with 93 percent of normal at Birchbank and decreasing to 89 percent of normal below Rock Island below Wenatchee. With the high input flows of the Snake River the resultant flow of the Columbia River at The Dalles was 23 percent above normal. The Snake River as measured at Clarkston was 55 percent above normal and the Walla Walla at Touchet measured 115 percent above normal. Most streams flowing into the Columbia from Washington and Oregon along the southern edge had well above-normal runoff. Peshastin had the lowest runoff during the month of any station in the state--49 percent below normal. The only forecast made for the

state of Washington on February 1 is the April-September and April-June forecast for the Columbia River at The Dalles. This early in the season we expect that The Dalles will have a flow of 94,000,000 acre-feet during the April-September period. This is 89 percent of normal. The April-June forecast is for 63,000,000 acre-feet or 87 percent of normal.

state of Washington on February 1 is the April-September and April-June forecast for the Columbia River at The Dalles. This early in the season we expect that The Dalles will have a flow of 94,000,000 acre-feet during the April-September period. This is 89 percent of normal. The April-June forecast is for 63,000,000 acre-feet or 87 percent of normal.

COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about February 1, 1970, as per cent of the same date in 1969 and 1968 and average of record.

Tributary Basin	No. of Courses Average	Years of Record	1970 Snow Water Expressed as per cent of		
			1969	1968	1953-67 Avg.
<u>UPPER COLUMBIA BASIN</u>					
Pend Oreille	6 - 8	6 - 33	65	97	99*
Kettle	11 - 14	4 - 30	60	87	86*
Colville	2 - 5	8 - 11	58	95	97*
Spokane	3	8 - 25	58	129	101
Okanogan	21 - 24	3 - 32	76	98	95
Methow	9	7 - 32	74	107	111
Chelan	1	16	61	75	81
Entiat	1 - 2	3 - 9	80	141	143
Wenatchee	7 - 9	2 - 25	82	181	131
Yakima	15 - 22	2 - 48	91	179	134
Ahtanum	1	28	80	158	144
<u>LOWER COLUMBIA</u>					
Klickitat	1	12	81	281	--
White Salmon	2	12	62	108	126
Lewis	14 - 17	7 - 12	47	78	82
Cowlitz	8 - 9	6 - 18	62	130	86
<u>PUGET SOUND</u>					
Nisqually	3 - 4	4 - 13	76	172	81
White	1	18	77	107	88
Green	5 - 8	8 - 23	48	160	88
Snoqualmie	1	20	63	159	100
Skykomish	1 - 2	2 - 25	68	199	103
Skagit	1 - 7	12 - 22	66	70	87
<u>OLYMPIC PENINSULA</u>					
Skokomish	4 - 5	6 - 12	57	70	82
Elwha	1	10	49	71	60
Dungeness	1	16	66	110	82

RESERVOIR STORAGE - 1000 Acre Feet

BASIN or STREAM	RESERVOIR	USABLE ^{1/} CAPACITY	1970	Measured (February)		Normal*
				1969	1968	
<u>COLUMBIA</u>						
Spokane	Coeur d'Alene Lake	225.1	161.1	134.1	93.8	137.0
Columbia	Franklin D. Roosevelt Lk	5232.0	4449.4	2430.3	2485.1	3812.5
Columbia	Banks Lake	761.8	597.3	714.9	714.9	494.0
Okanogan	Conconully Reservoir	13.0	7.0	4.3	6.3	5.6
Okanogan	Salmon Lake	10.5	7.8	6.4	9.0	8.6
Chelan	Lake Chelan	676.1	187.8	254.4	461.4	318.4
<u>YAKIMA</u>						
Yakima	Keechelus Lake	157.8	50.3	105.0	126.1	92.1
Kachess	Kachess Lake	239.0	166.9	194.0	211.3	172.2
Cle Elum	Lake Cle Elum	436.9	155.6	253.3	372.1	241.1
Bumping	Bumping Lake	33.7	9.1	4.2	16.9	9.9
Tieton	Rimrock Lake	198.0	75.9	135.7	130.4	111.3
<u>PUGET SOUND</u>						
Skagit	Ross Reservoir	1202.9	849.3	835.7	1212.6	956.3
Skagit	Diablo Reservoir	90.6	83.6	82.6	86.0	85.6
Skagit	Gorge Reservoir	9.8	7.5	8.2	7.9	--

^{1/} Based on Active Storage

* 15-year average 1953-67

SOIL MOISTURE - February

Drainage Basin and Station	Number	Elev.	Profile Depth	(Inches) :		Soil Moisture Content		
				Total	:	(Inches) as of Feb. 1		
				Capacity	:	1970	1969	1968
<u>CRAB CREEK</u>								
Jack Woods	18B3m	2600	48	13.6	8.3	8.9	7.4	
Krause	18B4m	2440	48	13.6	7.2	7.9	5.7	
Sheffels	18B5m	2360	48	13.6	6.1	5.8	4.9	
Sherman	18B7m	2440	48	13.6	6.6	5.8	5.9	
Wheatridge	18B6m	2200	48	13.6	8.4	6.5	6.1	
<u>OKANOGAN</u>								
Salmon Meadows	19A2M	4500	48	5.4	2.1	3.0	2.8	
Trout Creek	3-M	3600	48	7.3	3.0*	2.8	4.7**	
<u>YAKIMA</u>								
Domery Flat	21B20m	2200	48	6.9	5.7	4.5	4.8	
Lake Cle Elum	21B14M	2200	48	12.8	9.1	9.1	9.2	
<u>WALLA WALLA</u>								
Couse	17C3m	3650	48	11.1	Not Measured	10.2	7.5	
Helmers	17C2M	4400	48	12.0	Not Measured	10.7	11.2	
<u>WENATCHEE</u>								
Upper Wheeler	20B7M	4400	48	12.7	6.8	8.7	10.0	

* January 1 measurement

** December 1 measurement

FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile Depth	(Inches) :	Soil Moisture Content		
				Total :	(Inches) as of Oct. 1		
				Capacity :	1969	1968	1967
<u>CRAB CREEK</u>							
Jack Woods	18B3m	2600	48	13.6	7.5	7.1	5.2
Krause	18B4m	2440	48	13.6	5.9	5.2	4.9
Sheffels	18B5m	2360	48	13.6	4.5	4.9	3.7
Sherman	18E7m	2200	48	13.6	4.2	3.9	3.6
Wheatridge	18B6m	2200	48	13.6	5.4	4.6	4.0
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	2.7	2.7	1.5
Trout Creek	3-M	3600	48	7.3	3.8*	4.1	4.0
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	Not available	3.1	4.8
Lake Cle Elum	21B14M	2200	48	12.8	Not available	5.2	9.1
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	6.1	7.4	5.4
Helmers	17C2M	4400	48	12.0	7.1	7.6	6.7
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	9.8	5.5	5.6

* November 1 measurement

PRECIPITATION ^{1/}

Division Averages and Departures

Drainage Divisions	FALL		WINTER	
	Sep - Oct	1969 ^{2/}	Nov - Dec	1969 - Jan. 1970 ^{2/}
	Average	Departure	Average	Departure
Columbia in Canada	4.73	+0.84	7.34	-1.72
Pend Oreille - Spokane	3.81	-0.07	11.13	-1.34
Northeastern Washington	2.91	+0.66	7.07	-0.67
Southeastern Washington	2.56	-0.09	9.68	+1.26
Central Washington	3.83	-0.61	18.50	-1.19
North Central Washington	2.02	+0.61	4.86	+0.28
Northwest Slope Cascades	12.20	+0.53	29.24	-6.39
Southwest Slope Cascades	9.55	+1.83	27.25	-0.90

Northeastern Washington	- Lower Spokane, Colville, Sanpoil and lower Kettle drainages.
Southeastern Washington	- Touchet, Tucannon and Palouse drainages.
Central Washington	- Yakima, Wenatchee and Chelan drainages..
North Central Washington	- Methow and Okanogan drainages.
Northwest Slope Cascades	- Puget Sound drainages.
Southwest Slope Cascades	- Lower Columbia drainages.

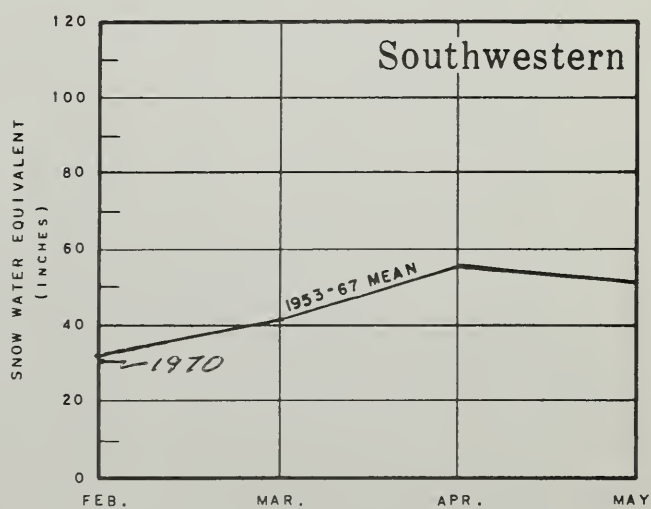
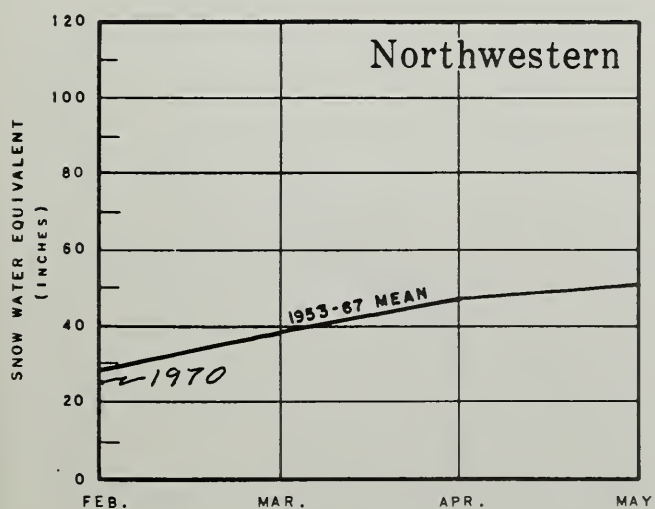
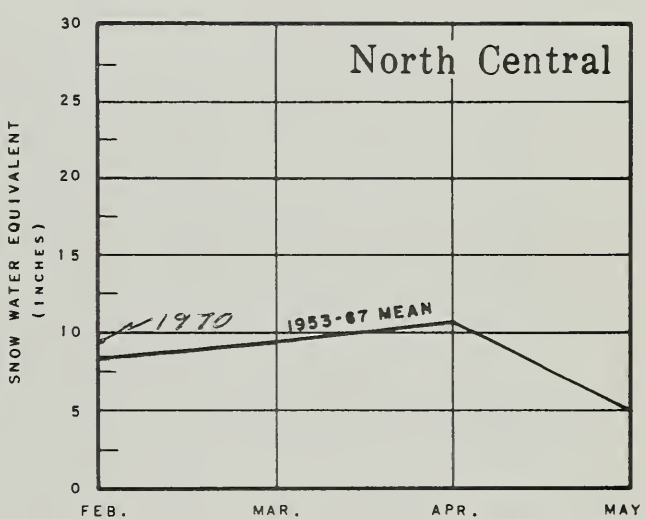
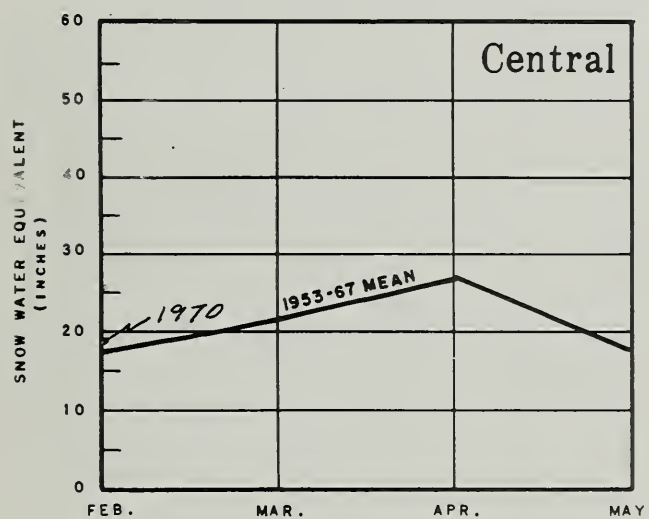
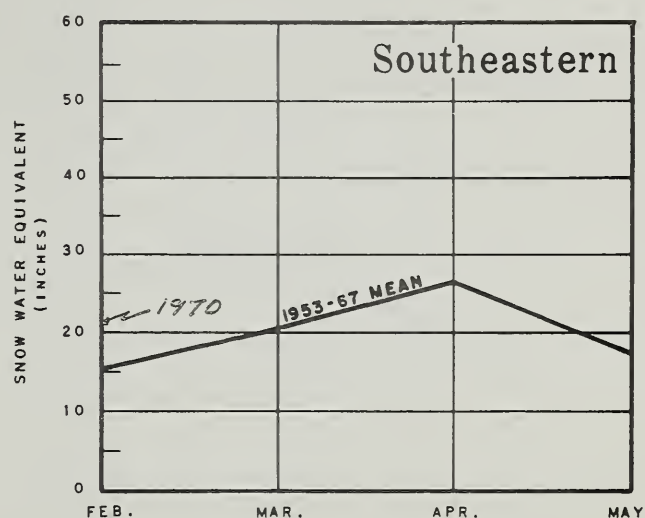
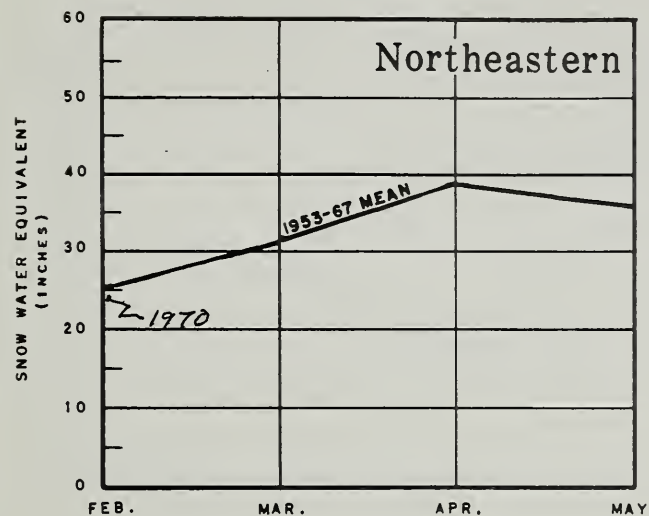
^{1/} - Preliminary analysis by U. S. Weather Bureau from data furnished by Meteorological Services of Canada and U. S. Weather Bureau

^{2/} - Departure from 15-year (1953-67) drainage division average.

WASHINGTON SNOW COVER

1970

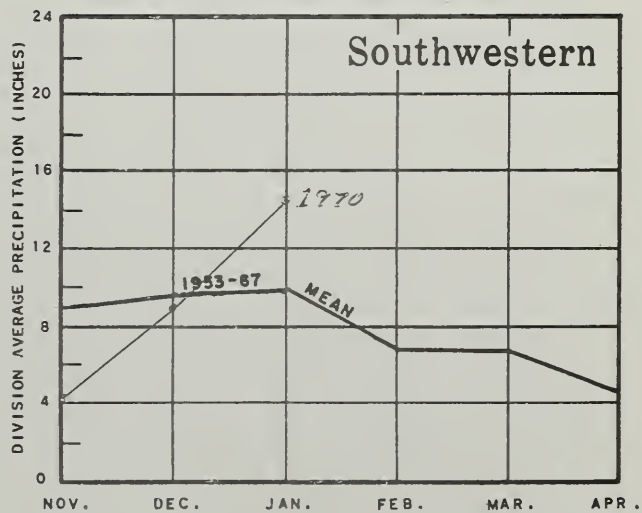
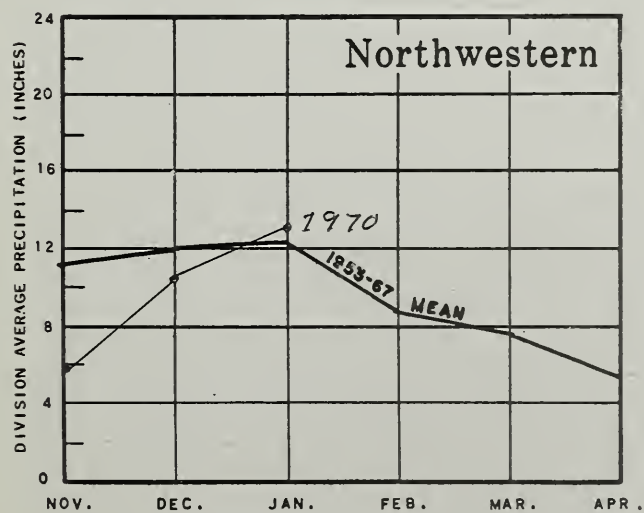
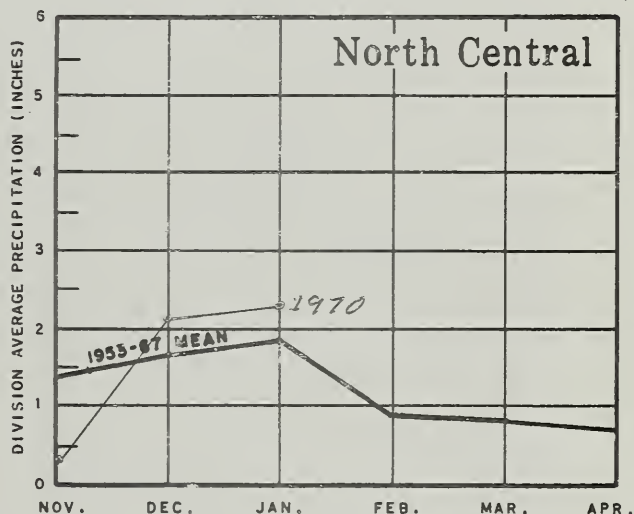
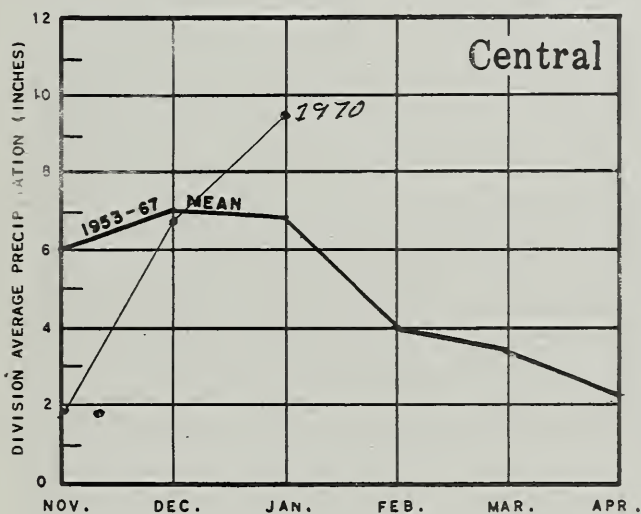
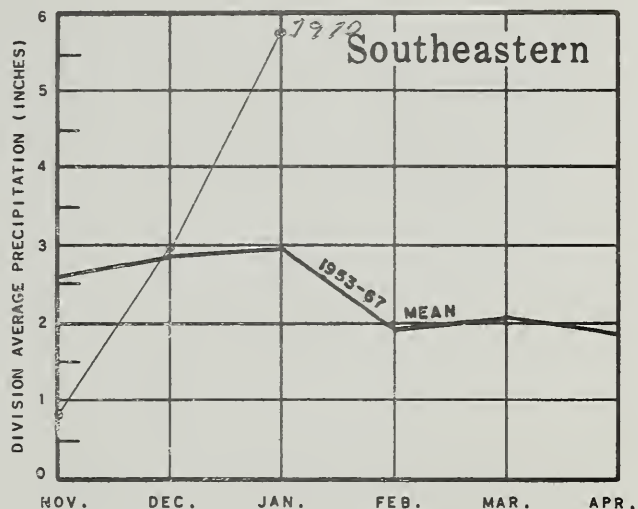
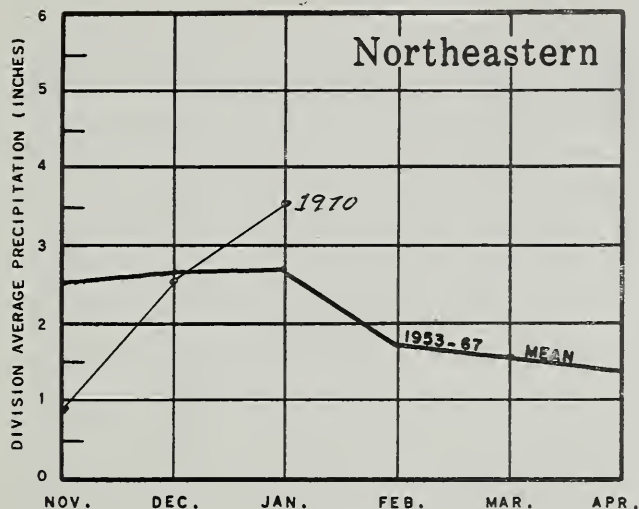
DRAINAGE AREAS



WASHINGTON VALLEY PRECIPITATION

1969-1970

DRAINAGE AREAS



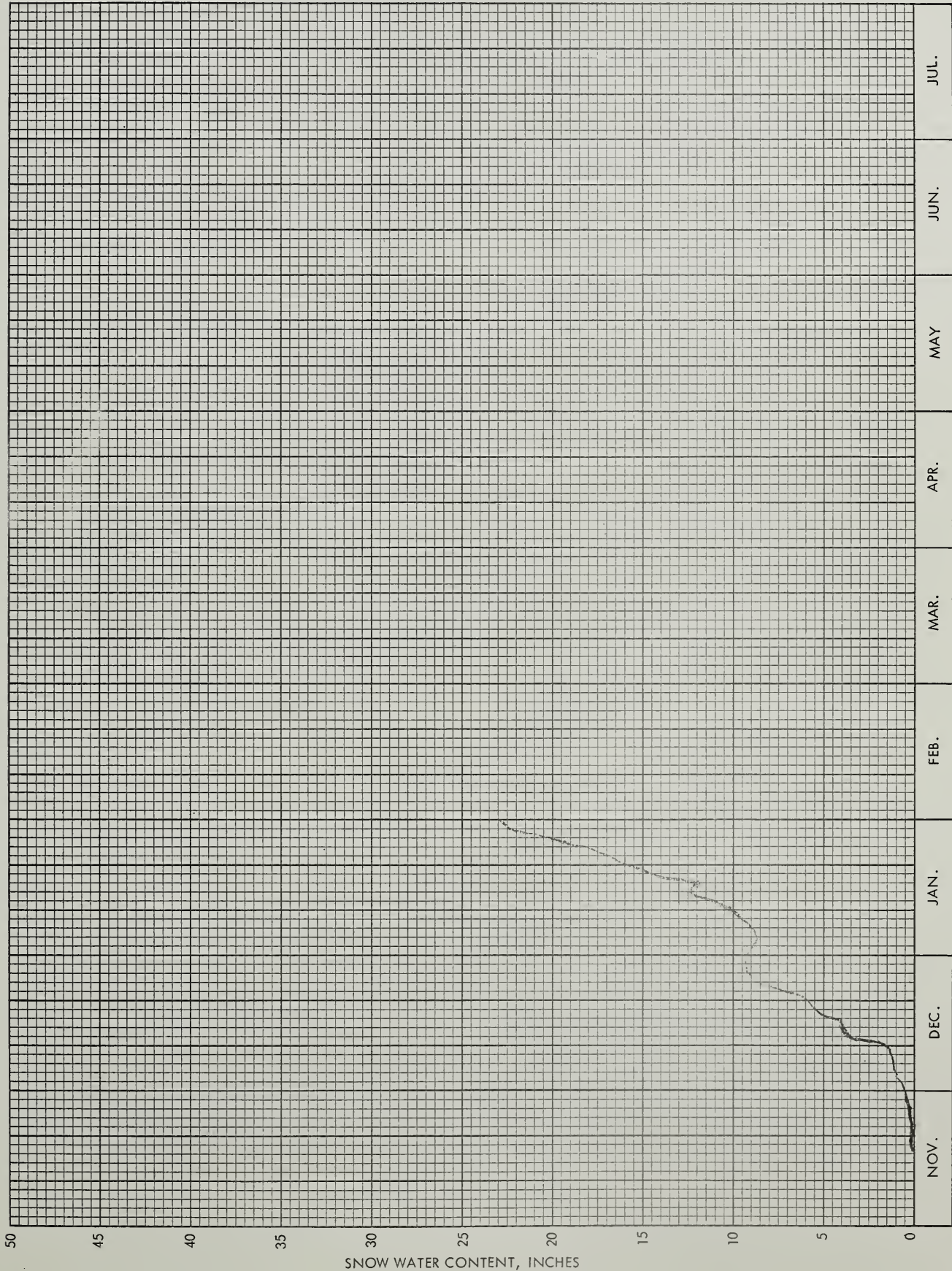
1969-70

SNOW PILLOW DATA

Berne-Mill Creek

Sec. 13 T. 26N R. 14E No. 21B4157 Drainage: Wenatchee

Lat. 47° 46' Long. 121° 01' Elev. 3170

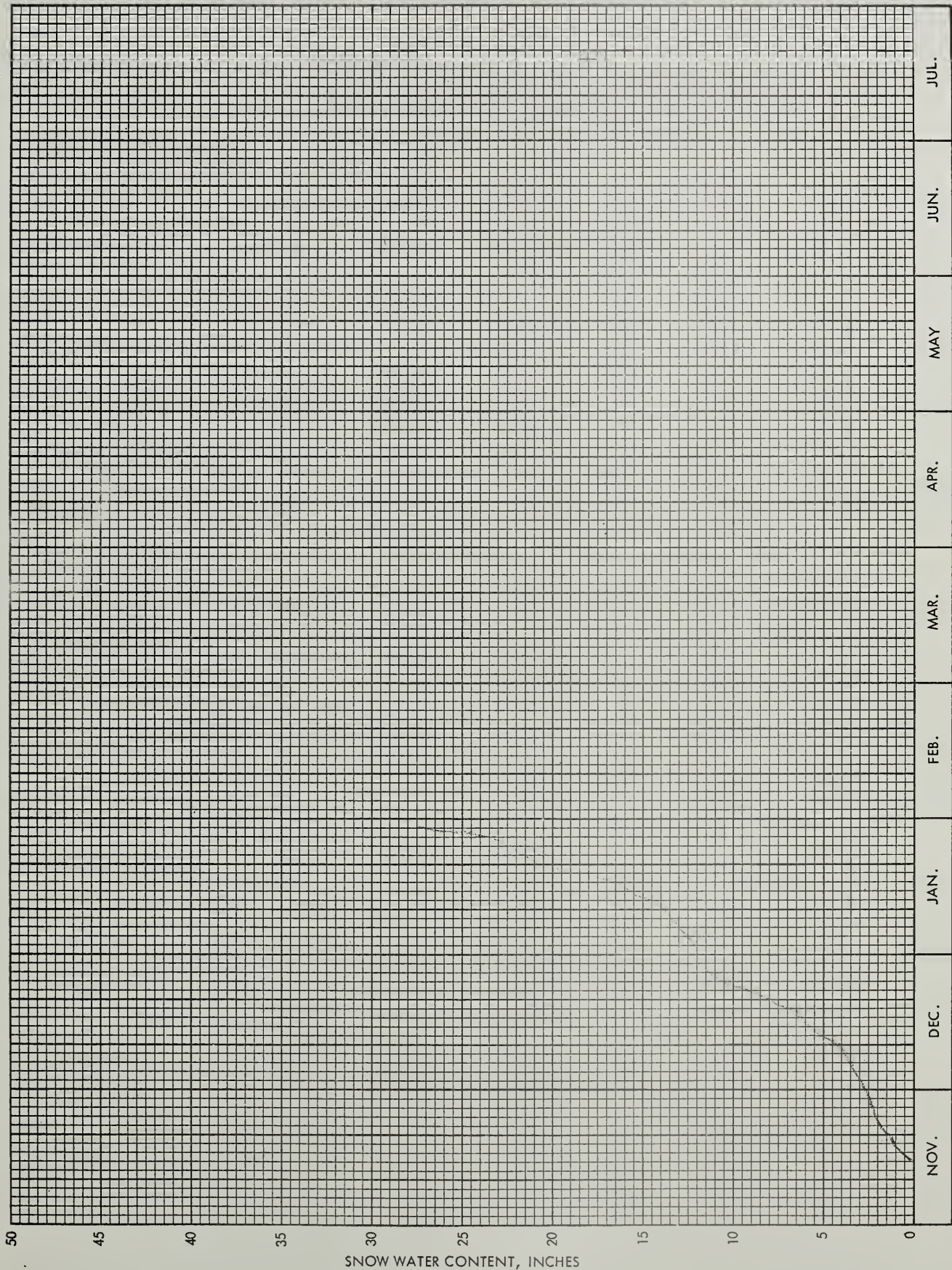


SNOW PILLOW DATA

Snowshoe Butte - 18

Sec. 28 T. 21N R. 9E No. 218435F Drainage: Green River

Lat. 47° 13' Long. 121° 22' Elev. 5000



SNOW DATA TO FEBRUARY 1, 1970 - APPENDIX 1

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average ++

U P P E R C O L U M B I A D R A I N A G EPEND OREILLE RIVER

Benton Meadow	16A2	2344	12/30	10	2.4	3.7	3.2
			2/1	33	8.3	10.4	5.1
Benton Spring	16A3	4900	12/30	18	3.8	9.1	8.6
			1/30	47	11.2	18.0	14.0
#Chewelah	17A4	4925	1/31	48	10.5	--	13.2*
Lookout	15B2	5250	12/31	36	9.0	18.8	15.7
			2/2	88	24.5	38.7	25.0
Nelson	Canada	3050	1/30	38	8.9	15.0	12.2
Schweitzer Bowl	16A6	4500	12/30	33	7.7	18.5	--
			1/30	71	21.0	28.8	--
Schweitzer Ridge	16A5	6100	12/30	46	12.0	29.7	--
			1/30	83	23.7	52.0	--
Winchester Creek	17A3	2970	1/29	41	9.4	13.3	9.2*

KETTLE RIVER

Big White Mountain	Canada	5500	2/1	41	9.4	16.0	--
Boulder Raod	18A2	1450	10/29	0	0.0	0.0	--
			11/12	0	0.0	0.0	--
			11/24	0	0.0	0.0	--
			12/11	4	0.5	1.0	--
			12/23	6	1.7	3.3	2.1*
			1/13	9	1.9	6.1	3.4*
			1/26	13	4.0	6.9	4.1*
Butte Creek	18A3	4070	10/29	0	0.0	0.0	--
			11/12	0	0.0	1.9	--
			11/24	0	0.0	2.0	1.5*
			12/11	6	0.7	4.1	2.9*
			12/23	17	3.0	7.6	4.3*
			1/13	18	2.6	9.4	5.8*
			1/26	27	6.0	9.9	6.6*
Cabin Creek	18A8	3170	10/29	0	0.0	0.0	--
			11/12	0	0.0	1.7	--
			11/24	0	0.0	1.2	1.1*
			12/11	6	0.8	3.1	2.4*
			12/23	17	3.7	6.2	4.2*
			1/13	16	2.8	9.0	5.5*
			1/26	26	5.3	9.2	6.0*

Not located directly on this drainage

* Adjusted 1953-67 average

++ 1953-67 period

APPENDIX 2

SNOW

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	No.	Elevation				Last Year	Average ††
KETTLE RIVER (Cont.)							
Carmi	Canada	4100	2/1	20	4.6	6.6	5.4**
Farron	Canada	4000	1/30	32	7.7	15.3	10.0
Goat Creek	18A4	3595	10/29	0	0.0	0.0	--
			11/12	0	0.0	1.4	--
			11/24	0	0.0	0.1	1.0*
			12/11	6	0.5	2.8	2.1*
			12/23	17	3.4	6.4	3.7*
			1/13	16	2.5	7.9	4.9*
			1/26	27	6.0	8.8	5.5*
Lower Trapping Creek	Canada	3050	2/1	20	3.8	6.4	4.8**
#Monashee Pass	Canada	4500	1/26	24	6.4	10.3	9.9**
Old Glory Mountain	Canada	7000	2/1	48	13.0	28.0	18.2
Snow Caps Creek	18A5	2150	10/29	0	0.0	0.0	--
			11/12	0	0.0	0.0	--
			11/24	0	0.0	0.0	--
			12/11	6	0.7	1.5	--
			12/23	8	2.7	4.2	2.3*
			1/13	12	2.5	6.3	3.5*
			1/26	18	5.0	6.9	4.3*
Snow Caps Trail	18A6	2720	10/29	0	0.0	0.0	--
			11/12	0	0.0	1.0	--
			11/24	0	0.0	0.2	--
			12/11	6	0.8	2.6	1.7*
			12/23	13	3.0	5.3	3.0*
			1/13	14	1.6	7.4	4.0*
			1/26	21	4.8	8.0	4.9*
Summit G. S.	18A7	4600	10/29	0	0.0	0.0	--
			11/12	0	0.0	2.1	--
			11/24	0	0.0	2.1	1.7*
			12/11	5	0.7	3.3	3.0*
			12/23	14	2.7	5.4	4.3*
			1/12	16	2.9	7.6	5.9*
			1/26	23	4.7	8.0	6.7*
Upper Trapping Creek	Canada	5500	2/1	27	5.6	9.1	7.4*

Not located directly on this drainage

* Adjusted 1953-67 average

** Average for years of record

++ 1953-67 period

1894

APPENDIX 3

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average †

COLVILLE RIVER

Baird	17A6	3215	2/1	29	5.6	9.0	5.9*
Carlson	18A9	2885	2/1	22	4.2	7.8	4.3*
Chewelah	17A4	4925	1/31	48	10.5	--	13.2*
Stranger Mountain	17A5	4990	1/31	46	10.0	--	9.8*
Togo	18A10	3370	2/1	39	9.3	--	8.6*

SPOKANE RIVER

4th of July Summit	16B3	3100	12/31	11	1.8	3.7	3.5
			2/2	32	7.5	14.0	6.4
#Lookout	15B2	5250	12/31	36	9.0	18.8	15.7
			2/2	88	24.5	38.7	25.0
Sherwin	16C1	3200	1/3	18	3.8	5.6	--
			1/31	32	9.3	16.2	10.4

OKANOGAN RIVER

Aberdeen Lake	Canada	4300	1/30	20	4.4	--	5.1**
Blackwall Peak	Canada	6250	1/29	70	19.0	24.8	24.0**
Brenda Mine	Canada	4800	1/26	31	6.8	10.6	--
Brookmere	Canada	3200	1/27	29	6.6	7.1	7.1
Carrs Landing Lower	Canada	2250	1/31	13	2.3	3.1	--
Carrs Landing Upper	Canada	3200	1/31	21	4.1	5.7	--
Clark +	19A8a	7000	Not Measured			--	--
Copper Mountain	Canada	4300	Late Report			5.4	5.0**
Enderby	Canada	6250	1/26	73	20.4	34.0	24.2**
Hamilton Hill	Canada	4900	Late Report			--	9.9**
#Harts Pass	20A5A	6500	1/30	90	26.0	36.7	28.2*
#Horseshoe Basin +	19A5a	7000	2/4	32	8.6	15.4	9.7*
Isintok Lake	Canada	6300	1/31	18	4.4	5.8	5.7**
Lost Horse Mountain	Canada	6300	2/3	23	4.6	6.2	6.3**
#Loup Loup	19A7	4650	1/29	39	9.6	11.6	6.6*
McCulloch	Canada	4200	1/28	23	4.3	5.0	4.8
Missezula Mountain	Canada	5100	Late Report			--	6.2**
Mission Creek	Canada	6000	1/31	38	9.6	16.7	13.3**
Monashee Pass	Canada	6000	1/26	24	6.4	10.3	9.9**
Mount Kobau	Canada	6000	1/29	35	9.6	10.6	--
Muckamuck +	19A9a	6390	Not Measured			--	--
Mutton Creek No. 1	19A1	5700	1/29	43	11.0	15.0	9.7*
Mutton Creek No. 2	19A4	6000	1/29	42	10.6	15.5	10.1*
New Copper Mountain	Canada	4300	2/1	28	6.3	6.5	5.2**
Paysayten +	20A28a	4300	Not Measured			19.2	11.6*
Postill Lake	Canada	4500	1/30	24	5.0	5.7	5.8**
Rusty Creek	19A3	4000	1/28	31	6.6	10.0	5.6

Not directly located on this drainage

* Adjusted 1953-67 average

† 1953-67 period

** Average for years of record

+ Snow water equivalent estimated from aerial stadia observation

APPENDIX 4

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	NO.	Elevation				Last Year	Average $\dagger\dagger$

OKANOGAN RIVER (Cont.)

Salmon Meadows	19A2	4500	1/29	39	9.2	11.4	7.5*
Silver Star Mountain	Canada	6050	1/30	54	15.2	28.4	18.0**
Starvation Mountain +	19A10a	6750	Late Report			--	--
Summerland Reservoir	Canada	4200	2/1	25	5.9	7.4	7.6**
Touts Coulee	19A6	2845	1/28	23	4.0	4.6	3.1*
Trout Creek	Canada	4700	1/29	22	4.6	5.6	5.3

METHOW RIVER

Billy Goat Pass +	20A10a	6409	2/4	92	24.8	28.8	21.5*
Dollar Watch +	20A29a	7000	2/4	49	18.6	23.7	18.4*
Harts Pass	20A5A	6500	1/30	20	26.0	36.7	28.2*
Horseshoe Basin +	19A5A	7000	2/4	32	8.6	15.4	9.7*
Loup Loup	19A7	4650	1/29	39	9.6	11.6	6.6*
#Mutton Creek No. 1	19A1	5700	1/29	43	11.0	15.0	9.7*
#Mutton Creek No. 2	19A4	6000	1/29	42	10.6	15.5	10.1*
#Rusty Creek	19A3	4000	1/28	31	6.6	10.0	5.6
#Salmon Meadows	19A2	4500	1/29	39	9.2	11.4	7.5*
#War Creek Pass +	20A31a	6500	Not Measured			37.4	--

CHELAN LAKE BASIN

Cloudy Pass +	20A22a	6500	Not Measured			34.2	27.4*
Greenwood Flat +	20A25a	3540	Not Measured			31.0	21.6*
Little Meadows +	20A24a	5275	Not Measured			41.6	29.9*
Lyman Lake +	20A23A	5900	Not Measured			53.4	38.9*
Park Creek Flat +	20A13a	2220	Not Measured			--	27.8*
Park Creek Ridge	20A12A	4600	Not Measured			46.7	35.3*
Petersons +	20A16a	3730	Not Measured			31.0	26.2*
Rainy Pass	20A9	4780	1/30	81	22.4	36.6	27.5*
Safety Harbor +	20A30A	6300	Not Measured			28.2	--
War Creek Pass +	20A31a	6500	Not Measured			37.4	--

ENTIAT RIVER

Brief	20B19	1600	1/29	40	9.0	10.1	6.3*
Entiat Meadows +	20A33a	4800	Not Measured			38.2	--
Entiat River Trail +	20A34a	3150	Not Measured			25.7	--
Fox Camp +	20A36a	6510	Not Measured			43.3	--
Pope Ridge	20B20	4300	1/28	64	14.5	20.5	--
Pope Ridge SP	20B24SP	4300	Not Available			--	--
Pugh Ridge +	20A32a	6400	Not Measured			27.7	--
Shady Pass	20A37	6200	Not Measured			--	--
Snow Brushy +	20A35a	3850	Not Measured			31.1	--
Tommy Creek +	20B21a	5300	Not Measured			22.8	--

Not located directly on this drainage

* Adjusted 1953-67 average

 $\dagger\dagger$ 1953-67 period

** Average for years of record

+ Snow water equivalent estimated from aerial stadia observations

SNOW

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average $\frac{+}{-}$
WENATCHEE RIVER							
Berne-Mill Creek	21B23	2925	10/29	0	0.0	--	--
			11/14	0	0.0	2.6	1.2*
			12/1	Not Measured		5.0	4.8*
			12/15	21	4.5	11.0	7.3*
			12/30	33	9.2	16.2	11.4*
			1/14	47	11.5	27.2	17.1*
			1/30	80	23.0	30.3	20.7*
			Berne-Mill Creek New	21B41SP	3240	10/29	0
11/14	0	0.0				--	--
12/1	Not Measured					5.0	--
12/30	35	10.0				16.0	--
1/30	78	22.4				30.0	--
Blewett Pass No. 2	20B2	4270				12/30	20
			1/30	57	14.8	20.9	11.2
			Chiwaukum G. S.	20B16	1810	10/29	0
11/14	0	0.0				--	--
12/1	Not Measured					1.2	1.7*
12/15	16	2.7				4.0	2.7*
12/30	22	5.2				5.6	4.6*
1/14	32	6.4				11.4	7.5*
1/29	58	13.4				12.8	9.0*
Lake Wenatchee	20B5	1970	10/29	0	0.0	--	--
			11/14	0	0.0	--	--
			12/1	Not Measured		0.5	--
			12/15	13	2.0	5.0	3.7*
			12/30	19	4.6	7.6	5.8*
			1/14	29	6.1	15.0	9.6*
			1/29	54	13.7	15.6	12.0*
Leavenworth R. S.	20B17	1127	10/31	0	0.0	0.0	--
			11/14	0	0.0	0.0	--
			12/1	0	0.0	0.0	--
			12/11	16	2.0	2.4	--
			12/29	13	4.5	5.4	2.9*
			1/14	24	5.7	7.7	4.0*
			1/27	40	9.7	9.0	5.0*
#Lyman Lake +	20A23A	5900	Not Measured				

Not located directly on this drainage

++ 1953-67 period

* Adjusted 1953-67 average

+ Snow water equivalent estimated from aerial stadia observation

APPENDIX 6

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	No.	Elevation				Last Year	Average++

WENATCHEE RIVER (Cont.)

Merritt	20B18	2140	10/29	0	0.0	--	--
			11/14	0	0.0	1.0	--
			12/1	Not Measured		2.0	2.9*
			12/15	13	2.4	5.8	4.6*
			12/30	21	5.6	10.2	8.0*
			1/14	32	7.4	19.4	12.0*
			1/29	66	16.4	20.4	14.1*
Stevens Pass	21B1	4070	10/29	0	0.0	--	--
			11/14	0	0.0	7.0	--
			11/26	14	3.1	12.1	10.0*
			12/15	40	8.6	21.9	14.7*
			12/30	64	16.4	29.7	20.8
			1/14	78	21.7	47.5	26.6
			1/29	127	35.3	51.5	34.4
Stevens Pass Sand Shed	21B45	3700	10/29	0	0.0	--	--
			11/14	0	0.0	3.0	--
			12/1	Not Measured		6.8	--
			12/15	29	5.2	14.5	--
			12/30	43	11.4	19.4	--
			1/14	58	15.4	33.6	--
			1/29	97	25.0	37.0	--

COLOCKUM CREEK

Colockum Creek	20B22	5300	1/29	51	14.3	14.6	--
Colockum Creek No. 2	20B23	4300	1/29	46	12.0	10.2	--

SQUILCHUCK CREEK

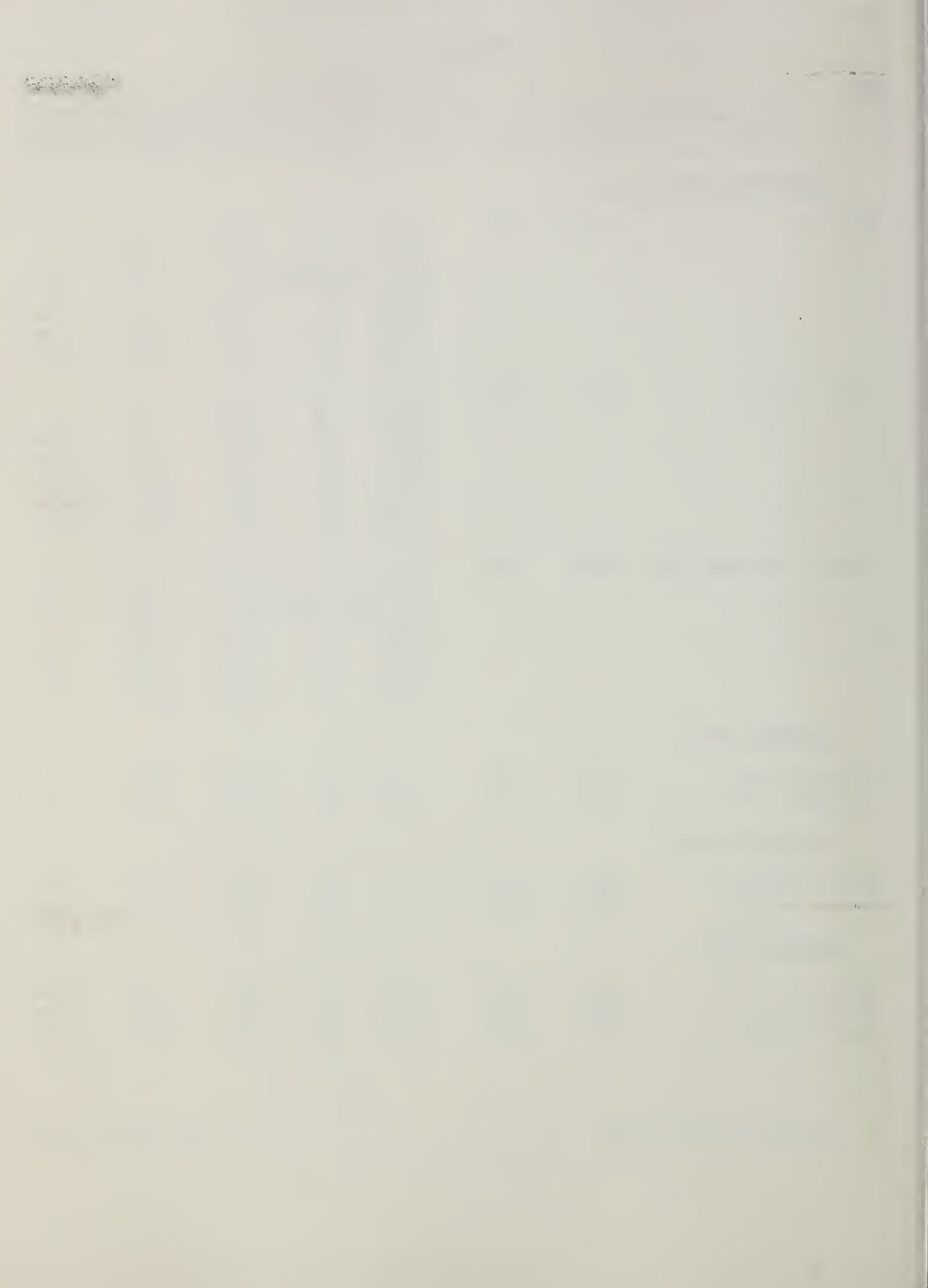
Beehive Springs	20B3	4400	1/27	44	10.4	11.4	5.1*
Scout-A-Vista	20B4	3400	1/27	48	9.8	10.7	5.4*

STEMILT CREEK

Jump-Off	20B8	4450	1/28	47	10.2	9.8	4.8*
Stemilt Slide	20B6	5000	1/28	53	11.0	15.4	10.0*
Upper Wheeler	20B7	4400	1/28	47	11.6	12.6	6.5*

* Adjusted 1953-67 average

++ 1953-67 period



APPENDIX 7

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average††
<u>YAKIMA RIVER</u>							
#Ahtanum R. S.	21C11	3100	12/26	22	4.6	4.0	3.2
			1/27	43	8.2	10.2	5.7
#Blewett Pass No. 2	20B2	4270	12/30	20	4.6	11.7	6.3
			1/30	57	14.8	20.9	11.2
Bumping Lake (Old)	21C8	3450	12/15	21	4.2	4.1	4.2*
			1/2	29	8.9	--	6.6
			1/15	42	12.0	14.7	10.6*
			1/31	71	22.2	17.4	12.3
Bumping Lake New	21C36	3400	12/15	25	4.9	4.5	--
			1/2	35	9.6	--	--
			1/15	49	13.4	16.6	--
			1/31	77	24.2	21.3	--
#Cayuse Pass	21C6	5300	12/28	85	23.6	43.0	--
			1/30	149	49.8	64.4	56.3*
Colockum Pass	20B9	5370	1/30	56	12.7	14.8	--
Cooke Creek	20B10	4123	1/30	31	9.6	8.1	--
Grouse Camp	20B11	5385	Not Measured			16.4	12.2*
High Creek	20B12	2930	1/30	33	7.7	8.4	4.6*
Joe Lake +	21B46a	4624	1/29	153	45.9	41.2	--
Lake Cle Elum	21B14M	2200	12/15	8	2.0	3.2	1.7*
			12/31	12	3.6	6.3	3.9*
			1/14	19	4.5	12.3	5.9*
			1/29	44	11.7	15.4	7.8
Lemah Creek +	21B47a	3327	1/29	108	32.4	31.5	--
Manashtash	20C1	3935	1/28	41	8.4	6.0	3.4*
Morse Lake	21C17	5400	1/30	130	39.6	51.4	39.7*
Nanum	20B13	3875	1/30	42	9.1	10.6	6.9*
#Olallie Meadows	21B2	3625	1/29	92	30.3	48.2	30.2*
#Satus Pass	20D1	4030	1/29	39	12.1	14.9	--
#Stampede Pass	21B10	3000	12/1	9	2.0	11.7	7.4*
			12/15	21	6.5	31.8	10.8*
			1/1	55	16.9	32.0	16.9*
			1/15	47	15.0	45.4	21.4*
			2/1	98	27.9	50.0	28.8
Trail Creek	20B14	3360	1/30	19	5.3	4.5	--
Tunnel Avenue	21B8	2450	12/15	9	1.8	6.3	5.5*
			12/30	21	4.8	--	8.6
			1/14	31	7.1	23.8	13.1*
			1/29	67	17.5	25.6	17.0
Walters Flat	20B15	3360	1/30	38	8.0	8.9	5.9*

Not located directly on this drainage

†† 1953-67 period

* Adjusted 1953-67 average

+ Snow water equivalent estimated from aerial stadia observation

APPENDIX 8

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	No.	Elevation				Last Year	Average ++

YAKIMA RIVER (Cont.)

Waptus Lake +	21B49a	3024	1/29	102	30.6	New Marker	
White Pass (E. Side)	21C28	4500	12/18	18	5.0	8.2	--
			1/2	31	6.7	--	11.1*
			1/20	48	14.1	20.1	13.7*
			1/30	62	19.3	23.4	16.7*
White Pass (L. Lake)	21C27	4500	12/18	19	6.7	9.5	--
			12/30	36	9.8	20.8	13.3*
			1/20	52	15.1	27.0	--
			1/30	73	23.8	29.0	20.6*

AHTANUM CREEK

Ahtanum R. S.	21C11	3100	12/26	22	4.6	4.0	3.2*
			1/27	43	8.2	10.2	5.7

LOWER COLUMBIA DRAINAGEASOTIN CREEK

Spruce Springs	17C4	5700	1/29	68	20.0	23.6	--
----------------	------	------	------	----	------	------	----

MILL CREEK

Homestead	17C1	4030	Not Measured			16.4	5.5*
Martin Springs	17C2	4400	Not Measured			19.1	8.4*
Walla Walla Diversion	18D13	2400	2/2	0	0.0	8.6	1.5

KLICKITAT RIVER

Satus Pass	20D1	4030	1/29	39	12.1	14.9	--
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WHITE SALMON RIVER

Cultus Creek	21C12	4000	12/31	51	16.6	28.4	15.4*
			1/29	84	28.4	45.3	29.4*
#Surprise Lakes	21C13A	4250	12/31	50	16.0	--	18.5*
			1/29	85	30.3	50.2	32.7*

WIND RIVER

Old Man Pass	21D19	3100	12/28	19	4.3	--	4.1*
			1/29	30	8.1	24.8	12.5*

Not located directly on this drainage

++ 1953-67 period

* Adjusted 1953-67 average

+ Snow water equivalent estimated from aerial stadia observation

APPENDIX 9

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average ++
<u>LEWIS RIVER</u>							
Blue Lake +	21C22a	4800	12/28	96	25.0	44.1	30.1*
			1/29	152	53.2	67.5	56.0*
Bob's Trail	21C21	2200	12/28	9	2.0	--	6.3*
			1/30	19	4.6	18.0	9.7*
Calamity Ridge +	22D1a	2500	12/30	8	1.8	--	--
			1/29	10	3.3	24.1	--
Council Pass +	21C18a	4200	12/28	45	13.0	22.0	18.4*
			1/29	80	25.6	39.0	27.4*
#Cultus Creek	21C12	4000	12/31	51	16.6	28.4	15.4*
			1/29	84	28.4	45.3	29.4*
Divide Meadow +	21C29a	5600	12/28	46	14.7	28.5	24.7*
			1/29	104	37.4	--	39.5*
Grand Meadow	21C25	3500	12/31	30	7.9	16.4	9.7*
			1/29	52	15.0	28.6	16.9*
Lone Pine Shelter	21C26	3800	12/31	41	10.8	19.1	--
			2/1	74	22.3	38.4	28.8*
Marble Mountain +	22C5a	3200	12/28	35	9.8	16.2	--
			1/28	32	12.8	41.5	--
#Mosquito Meadows	21C19	4100	12/31	47	12.9	18.0	--
			2/1	79	23.1	37.5	31.8*
New Muddy River	22C6	1400	12/27	3	0.7	--	--
			1/30	10	2.2	20.0	--
Old Man Pass	21D19	3100	12/28	19	4.3	--	4.1
			1/29	30	8.1	24.8	12.5*
Plains of Abraham +	22C1a	4400	12/28	90	24.3 [@]	37.5	22.1*
			1/29	183		60.8	39.0*
Smith Creek Road	22C4	2100	12/27	23	7.9	--	6.5*
			1/30	38	14.2	27.5	11.9*
Spencer Meadow +	21C20a	3400	12/28	24	6.2	13.5	7.8*
			1/29	38	11.0	35.4	14.3*
Surprise Lakes	21C13A	4250	12/31	50	16.0	--	18.5*
			1/29	85	30.3	50.2	32.7*
Table Mountain +	21C24a	4200	12/28	54	15.7	24.6	21.1*
			1/29	95	30.4	43.6	32.1*
Timbered Peak +	21D18a	3000	12/31	12	2.8	--	--
			1/29	12	4.0	--	12.5

COWLITZ RIVER

Cayuse Pass	21C6	5300	12/28	85	23.6	43.0	--
			1/30	149	49.8	64.4	56.3*

Not located directly on this drainage

++ 1953-67 period

* Adjusted 1953-67 average

+ Snow water equivalent estimated from aerial stadia observation

@ Aerial marker depth affected by avalanches

APPENDIX 10

SNOW

SNOW			THIS YEAR			PAST RECORD	
DRAINAGE BASIN and/or SNOW COURSE			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	No.	Elevation				Last Year	Average ++
<u>COWLITZ RIVER (Cont.)</u>							
Mosquito Meadows	21C19	4100	12/31	47	12.9	18.0	--
			2/1	79	23.1	37.5	31.8*
Ohanapecosh	21C32	2200	12/30	9	2.4	9.6	--
			1/30	31	8.0	17.3	13.7*
Packwood Lake	21C31	2870	12/28	7	1.2	9.4	--
			2/3	22	5.4	19.2	8.6*
Pigtail Peak	21C33	5900	12/15	40	10.4	--	--
			12/30	58	16.1	41.8	--
			1/20	94	27.8	51.4	--
			1/30	113	35.3	54.4	--
Plains of Abraham +	22C1a	4400	12/28	90	24.3	37.5	22.1*
			1/29	183	@	60.8	39.0*
Potato Hill	21C14	4500	12/31	37	10.9	22.9	--
			2/2	80	24.5	36.6	20.8*
#White Pass (E. Side)	21C28	4500	12/18	18	5.0	8.2	--
			1/2	31	6.7	--	11.1*
			1/20	48	14.1	20.1	13.7*
			1/30	62	19.3	23.4	16.7*
#White Pass (L. Lake)	21C27	4500	12/18	19	6.7	9.5	--
			12/30	36	9.8	20.8	13.3*
			1/20	52	15.1	27.0	--
			1/30	73	23.8	29.0	20.6*
Willame Creek	21C30	3250	12/31	21	5.7	14.8	--
			1/30	50	12.7	27.4	21.4*

PUGET SOUND DRAINAGENISQUALLY RIVER

Ghost Forest	21C4	4550	12/29	50	12.6	20.9	--
			1/30	82	27.0	36.4	30.7*
Longmire	21C3	2760	12/29	12	2.2	5.1	--
			1/29	14	4.7	12.0	7.3*
New Paradise Park	21C35	5500	12/29	72	17.2	31.5	--
			1/29	138	48.0	43.8	--
Stem Glade	21C1	5050	12/29	79	21.1	36.9	--
			1/29	136	42.8	52.4	47.1*

WHITE RIVER

#Cayuse Pass	21C6	5300	12/28	85	23.6	43.0	--
			1/30	149	59.8	56.3*	

Not located directly on this drainage

++ 1953-67 period

* Adjusted 1953-67 average

+ Snow water equivalent estimated from aerial stadia observation

@ Aerial marker depth affected by avalanches

APPENDIX 11

SNOW			THIS YEAR			PAST RECORD	
DRAINAGE BASIN and/or SNOW COURSE			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average ++
GREEN RIVER							
Airstrip	21B24	1800	11/26	0	0.0	0.9	--
			12/28	5	0.5	--	--
			1/30	15	4.2	13.2	--
Charley Creek	21B25	1200	11/26	0	0.0	0.9	--
			12/27	0	0.0	4.1	--
			1/30	0	0.0	8.6	--
Lynn Lake	21B50	4000	11/26	0	0.0	New Course	
			12/28	25	6.5		
			1/30	24	7.5		
Grass Mtn #2	21B27	2900	11/26	0	0.0	3.1	2.7*
			12/27	23	5.4	--	6.0*
			1/30	36	13.1	22.8	13.6*
Grass Mtn #3	21B28	2100	11/26	0	0.0	1.0	--
			12/27	8	1.3	--	--
			1/30	14	4.3	16.7	--
Lester Creek	21B29	3100	11/26	0	0.0	4.4	3.5*
			12/28	28	5.8	--	9.8*
			1/30	48	12.6	27.3	16.3*
Sawmill Ridge	21B31	4700	11/26	7	0.8	9.0	8.0*
			12/28	43	9.0	25.0	12.0*
			1/30	62	19.6	35.4	27.8*
Snowshoe Butte	21B43SP	5000	12/17	25	5.4	--	--
			1/29	96	29.0	65.8	--
Stampede Pass	21B10	3000	12/1	9	2.0	11.7	7.4*
			12/15	21	6.5	31.8	10.8*
			1/1	55	16.9	32.0	16.9*
			1/15	47	15.0	45.4	21.4*
			2/1	98	27.9	50.0	28.8
Twin Camp	21B30	4100	11/26	3	1.0	6.1	--
			12/28	34	8.4	15.8	--
			1/30	55	16.0	22.8	--
SNOQUALMIE RIVER							
Olallie Meadows	21B2	3625	1/29	92	30.3	48.2	30.2

* Adjusted 1953-67 average

++ 1953-67 period

APPENDIX 12

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	No.	Elevation				Last Year	Average++
<u>SKYKOMISH RIVER</u>							
#Stevens Pass	21B1	4070	10/29	0	0.0	--	--
			11/14	0	0.0	7.0	--
			11/26	14	3.1	12.1	10.0*
			12/15	40	8.6	21.9	14.7*
			12/30	64	16.4	29.7	20.8
			1/14	78	21.7	47.5	26.6
			1/29	127	35.3	51.5	34.4
#Stevens Pass Sand Shed	21B45	4070	10/29	0	0.0	--	--
			11/14	0	0.0	3.0	--
			12/1	Not Measured		6.8	--
			12/15	29	5.2	14.5	--
			12/30	43	11.4	19.4	--
			1/14	58	15.4	33.6	--
			1/29	97	25.0	37.0	--

SKAGIT RIVER

Beaver Creek Trail	21A4	2200	1/29	35	8.6	--	--
Beaver Pass	21A1	3680	1/29	69	21.7	32.2	--
Brown Top Ridge +		6000	1/29	114	29.6	New Marker	
#Cloudy Pass +	20A22a	6500	Not Measured			34.2	27.4*
Devils Park	20A4	5900	1/30	82	24.3	33.7	30.2*
Freezeout Creek Trail	20A1	3500	1/29	36	9.4	12.9	--
Freezeout Meadow	20A2	5000	1/29	69	17.1	22.9	--
#Harts Pass	20A5A	6500	1/30	90	26.0	36.7	28.2*
Klesilkwa	Canada	3700	2/1	38	9.1	--	9.5**
Lake Hozomeen	21A2	2600	1/29	30	6.6	--	--
#Lyman Lake	20A23A	5900	Not Measured			53.4	38.9*
Meadow Cabins	20A8	1900	1/30	17	4.6	10.5	--
#Rainy Pass	20A9	4780	1/30	81	22.4	36.6	27.5*
Thunder Basin	20A7	4200	1/30	54	14.1	--	--

BAKER RIVER

Baker Pass +	21A27a	4900	12/2	12	--	New Marker	
			12/15	54	--		
			1/2	78	--		
			1/15	100	32.0		
			1/30	124	47.1		
Dock Butte +	21A11A	3800	12/2	12	--	--	--
			12/15	32	--	16.8	--
			1/2	70	--	22.4	--
			1/15	65	20.8	42.9	--
			1/30	84	31.9	63.5	46.8*

Not located directly on this drainage

++ 1953-67 period

** Average for years of record

* Adjusted 1953-67 average

+ Snow water equivalent estimated from aerial stadia observation

APPENDIX 13

SNOW			THIS YEAR			PAST RECORD	
DRAINAGE BASIN and/or SNOW COURSE			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	No.	Elevation				Last Year	Average
BAKER RIVER (Cont.)							
Easy Pass +	21A7A	5200	12/2	8	--	--	--
			12/15	26	--	--	--
			1/2	53	--	26.8	--
			1/15	Not Measured		45.8	--
			1/30	114	43.3	57.6	59.0*
Jasper Pass +	21A6A	5400	12/15	62	--	--	--
			1/2	90	--	41.0	--
			1/15	122	39.0	62.4	--
			1/30	154	58.5	79.7	68.5*
Marten Lake +	21A9A	3600	12/15	50		17.3	--
			1/2	66		28.1	--
			1/15	93	29.8	53.1	--
			1/30	118	44.8	62.8	56.4*
Mt. Blum +	21A18a	5800	12/2	4	--	--	--
			12/15	24	--	--	--
			1/2	30	--	22.4	--
			1/15	48	15.4	36.5	--
			1/30	90	34.2	47.6	--
#Panorama New	21A26	4300	1/12	89	28.6	40.0	--
			1/26	105	39.7	49.0	--
#Panorama SP	21A25SP	4300	Not Measured				
Rocky Creek	21A12A	2100	12/2	0	--	--	--
			12/15	2	--	2.9	--
			1/2	6		12.5	--
			1/15	27	8.6	25.5	--
			1/30	32	12.2	40.7	19.6*
Schreibers Meadow	21A10A	3400	12/2	12	--	--	--
			12/15	34	--	12.0	--
			1/2	51	--	21.3	--
			1/15	65	20.8	43.5	--
			1/30	86	32.7	56.9	42.5*
S. F. Thunder Creek	21A14A	2200	12/15	0	--	--	--
			1/2	3	--	5.2	--
			1/15	6	1.9	13.9	--
			1/30	8	3.0	19.3	4.6*
Watson Lakes	21A8A	4500	12/15	30	--	--	--
			1/2	40	--	23.9	--
			1/15	68	21.8	40.0	--
			1/30	80	30.4	54.5	--

Not located directly on this drainage

++ 1953-67 period

* Adjusted 1953-67 average

+ Snow water equivalent estimated from aerial stadia observation

APPENDIX 14

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average††

NOOKSACK RIVER

Panorama New	21A26	4300	1/12	89	28.6	40.0	--
			1/26	105	39.7	49.0	--
Panorama SP	21A25SP	4300	Not Measured				

O L Y M P I C P E N I N S U L ADUNGENESS RIVER

Deer Park	23B4	5200	1/28	55	13.3	20.1	16.3*
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MORSE CREEK

Deer Park G. S.	23B13	4850	1/29	34	7.2	14.5	--
Cox Valley	23B14	4500	1/31	81	23.1	32.3	--

ELWHA RIVER

Hurricane	23B3	4500	1/29	51	10.5	21.5	17.5*
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SKOKOMISH RIVER

Black & White	23B7	4200	12/30	40	11.9	19.5	--
			1/28	63	19.1	43.2	29.0*
Black & White Lakes	23B6	4700	12/30	70	25.1	30.6	--
			1/28	100	38.2	49.0	41.5*
Four Streams	23B10	3000	12/30	35	9.4	14.7	--
			1/28	46	13.9	35.4	--
Home Sweet Home	23B5	5200	12/30	84	28.2	43.2	--
			1/28	126	39.8	67.5	54.8*
Sundown Pass	23B8	3900	Not Measured			31.0	--
			1/28	97	35.0	55.8	36.5*

* Adjusted 1953-67 average

†† 1953-67 period

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Agencies Assisting with Snow Surveys

GOVERNMENT AGENCIES

Canada:

Department of Lands, Forests and Water Resources,
Water Resources Service, British Columbia

States:

Washington State Department of Water Resources
Washington State Department of Natural Resources

Federal:

Department of the Army
Corps of Engineers
U. S. Department of Agriculture
Forest Service
U. S. Department of Commerce
Weather Bureau
U. S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service

PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company

OTHER PUBLIC AGENCIES

Okanogan Irrigation District
Wenatchee Heights Irrigation District

MUNICIPALITIES

City of Walla Walla
City of Tacoma
City of Seattle

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

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